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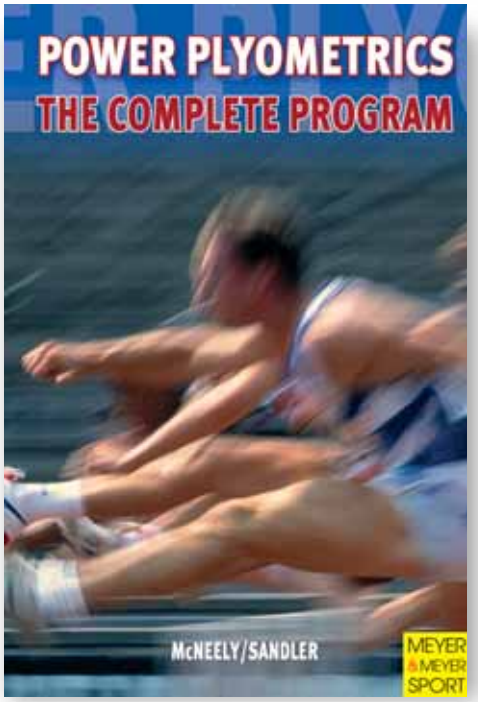
Power Plyometrics – The Complete Program

by Ed McNeely & David Sandler



Power Plyometrics is not especially for track and field athletes. Its range is wider and though it covers the sprint events, it includes specific programmes for 16 team and individual sports. It is not the first book about plyometrics either. However, what distinguishes it from other books on this topic can be read on the back cover. There it says that McNeely's and Sandler's book "is the only plyometrics book that allows readers to assess their individual starting level and then move through three progressively more challenging levels of training until they are ready to train for their specific sport."

Without any kind of introduction, the book starts with a chapter on the theory of "Plyometrics: Power of Performance." Here, power is defined as the rate at which an object can be moved, with as much force as possible. Maximum power for any activity can only be developed when the concentric phase, or the lifting, of a movement is performed as quickly as possible. In contrast to weight training exercises, which cannot be performed at maximum velocity and power throughout the movement, plyometric exercises are a more effective tool for developing maximum power through a range of motion. Plyometrics cause a muscle to rapidly stretch prior to the contraction required to perform a movement. This pre-stretch, which takes the form of a counter-movement, enables the muscle to contract more rapidly. The combination of eccentric-concentric contractions is known as the stretch-shortening cycle and is the result of the integrated functioning of two muscle sensors: one within the tendon of the muscle called the golgi tendon organ and the other within the muscle belly called the muscle spindle. The pre-stretch will only contribute to more-powerful movements if the muscle does not stretch too far past its normal range of motion.

Plyometric exercises always follow the same specific sequence:

- a landing phase
- an amortisation phase
- take-off.

The landing phase starts as soon as the muscles begin to experience an eccentric contraction, which serves to stretch the elastic component of the muscle and activate the stretch reflex. The amortisation phase, the time on the ground, is the most important part of a plyometric exercise since it represents the turn-around time from landing to take-off and is crucial for power development. If the amortisation phase is too long, the stretch reflex is lost and there is no plyometric effect. The take-off is the concentric contraction that follows the landing. During this phase, the stored elastic energy is used to increase jump height.

Plyometrics are typically divided into single response drills and multiple response drills. Single response jumps involve one explosive effort. Because the emphasis is on maximal effort and power in each repetition, there is a rest period between repetitions. Single response drills, e. g. jumping in place, standing jumps or depth/drop jumps, are normally done in short sets to avoid fatigue and maintain speed and power.

Multiple response jumps utilise the skills developed by jumping in place and in standing jumps. The exercise includes single- or double-leg jumps for distance, over multiple hurdles or onto progressively higher boxes. While bounds are multiple jumps for maximum distance, hops are normally done over multiple objects or over and back across an object.

With this explanatory basis set, Chapter 2, "Getting Started," describes the equipment needed and safety precautions to take. The authors advise that plyometric training should not be done until an individual has reached puberty and even then, depth jumps, which are the most intense form of plyometrics, should be prohibited. Not allowing depth jumps helps prevent possible injury to the bones' growth zones. More than half of this chapter is used for giving ample advice on how to warm up both passively and actively for plyometric training.

In Chapter 3, "Assessing Your Starting Point," several evaluations and sets of tests that should be conducted prior to starting a plyometric programme, are presented. The tests are very simple: Step Up, Box Landing, Lateral Hop Landing, Lateral Hop Distance, Single Leg Lying Hamstring Raise, One-Legged Balance T-Test, Push Up Hold, Prone Pull Up, and Lying Leg Raise. Once all tests have been completed, the subject's score must be totalled. Three ranges of scores are used to determine the type and level of programme that is most appropriate. If an athlete scores Level 3 in the movement screening, he or she can move onto performance testing to help determine if further strengthening is needed to allow him or her to get the most out of the plyometric programme. Performance testing includes jump tests (Static Vertical Jump, Counter Movement Vertical Jump, and Running Vertical Jump) and 1RM tests (Squat, Bench Press, and Deadlift). The purpose of these is to determine an appropriate starting level and what needs to be trained, but they can also be used to measure progress and provide a basis for adjusting and individualising the training programme.

Chapter 4 helps the coach to design a plyometric training programme. It is emphasied that the proper manipulation of volume, total number of repetitions and intensity are very important because, as very high intensity training, plyometrics can quickly lead to overtraining and overuse injuries. Unlike other strength training, sets of plyometric exercise are never taken to the point of muscular failure, which makes it more difficult to determine when an athlete stops benefiting from the set. As power outputs below 90% of maximum are insufficient to create a speed and power training effect, the plyometrics set should be terminated once power drops below this 90% mark. Although plyometric drills should be carried out at maximal intensity, new drills should be done at 70-80% until the athlete is comfortable and confident with the technique of the exercise. It is also stressed that rest and recovery are crucial variables in a plyometrics programme. The amount of rest

that is taken depends upon the duration of work and the type of drill or exercise used, varying from 0-7 minutes between sets or exercises. In the case of single response drills, it is common to take 5-10 seconds between reps to reset one's body position. The rest periods between sets should not be less than 2 minutes unless the work period is very short. Very short rest periods do not allow a complete recovery of the ATP-CP system, which provides the energy needed for plyometric exercises.

In Chapter 4 the authors also explain how to integrate plyometrics with other workouts. Some rules to be considered in this context are:

- If the workout combines skill and plyometrics, skill always takes priority.
- If plyometric and aerobic training are to be done in the same workout, the aerobic training should be relatively low intensity and done in the second half of the training session.
- Performing a strength training session prior to a plyometrics session will have a negative impact on the plyometrics session.
- Plyometrics before strength are less of a concern than strength before plyometrics. Hypertrophy-oriented workouts with moderate weight and moderate numbers of reps will not be affected by plyometric training.

The "Preparatory Drills and Exercises" described in Chapter 5 are used in the Level 1 and Level 2 programmes to prepare the athlete for full sport-specific plyometric training. They are designed to teach basic body movements and control. The presentation of plyometric exercises is continued in the following chapters:

- "Upper Body Plyometric Exercises" (Chapter 6)
- "Lower Body Plyometric Exercises" (Chapter 7)
- "Trunk Plyometric Exercises" (Chapter 8)
- "Full Body Plyometrics" (Chapter 9).

In Chapter 7, the Level 1 programme is presented. This is for those people who score above 40 on the movement screening described in Chapter 3. Those on Level 1 exhibit an inability to control their bodies, increasing their risk of injury when performing high intensity speed and power activities. The Level 1 programme lasts eight weeks and is designed to address body control and basic movement technique.

The Level 2 programme, which is presented in Chapter 11, is for those who score between 22 and 29 on the movement screening. They exhibit varying degrees of strength and flexibility imbalances that affect their ability to fully control their bodies during higher speed and higher intensity movements.

The "Plyo Programs" described in Chapter 12 are to be used after athletes have achieved Level 3 on the movement screening. The programmes for different sports are divided into beginner, intermediate and advanced. For the purposes of this book, "beginners" are defined as those people with no prior plyometric training experience, "intermediates" are those with 1-2 years of experience and "advanced" are those athletes with more than two years of plyometric training.

All in all, this very practice-oriented book reduces the presentation of theory to the bare minimum for understanding and applying plyometrics correctly. It is well-organised, easy to read and has a very attractive layout and photographs. Coaches and athletes will enjoy reading the book and will surely benefit from it.

Reviewed by Jürgen Schiffer

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